December 2002~~July 1995~~

KILLER WHALE (*Orcinus orca*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The killer whale is distributed worldwide from tropical to polar regions (Leatherwood and Reeves 1983). Sightings made in the waters between Iceland and Norway were generally oceanic in distribution, in waters ranging from 256 m to 2,652 m (averaging 1,242 m) and clumped in distribution (O'Sullivan and Mullin 1997). Sightings of these animals in the northern Gulf of Mexico occur primarily over the deeper waters off the continental shelf (Mullin and Fulling, in progress) ~~[Southeast Fisheries Science Center (SEFSC) unpublished data]~~. No killer whales have been reported on the Gulf of Mexico shelf waters other than those reported in 1921, 1985 and 1987 by Katona *et al.* (1988) despite extensive surveys in the area (O'Sullivan and Mullin 1997). Killer whales were seen only in the summer during ~~recent seasonal~~ GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~and Fargion 1996), ~~and~~were reported from May through June ~~in the late spring~~ during vessel surveys (Mullin and Fulling, in progress) (~~SEFSC unpublished data~~), and recorded in May, August and September by earlier opportunistic ship-based sources (O'Sullivan and Mullin 1997). Only one killer whale was opportunistically reported in November.

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation. Different stocks were identified in the northeastern Pacific based on morphological, behavioral, and genetic characteristics (Bigg *et al.* 1990; Hoelzel 1991). There is no information on stock differentiation for the Atlantic population, although an analysis of vocalizations of killer whales from Iceland and Norway indicated that stocks from these areas may represent different stocks (Moore et al. 1988). Thirty-two individuals have been photographically identified to date, with 6 individuals having been sighted over a five year period, and 1 whale resighted over 10 years. Three animals have been sighted over an extremely large geographic area of over 1,100 km.(O'Sullivan and Mullin 1997).

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of killer whales by survey year was zero in 1991, 138 (Coefficient of variation (CV)=0.96) in 1992, 641 (CV=0.50) in 1993 and 193 (CV=1.12) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of killer whales for all surveys

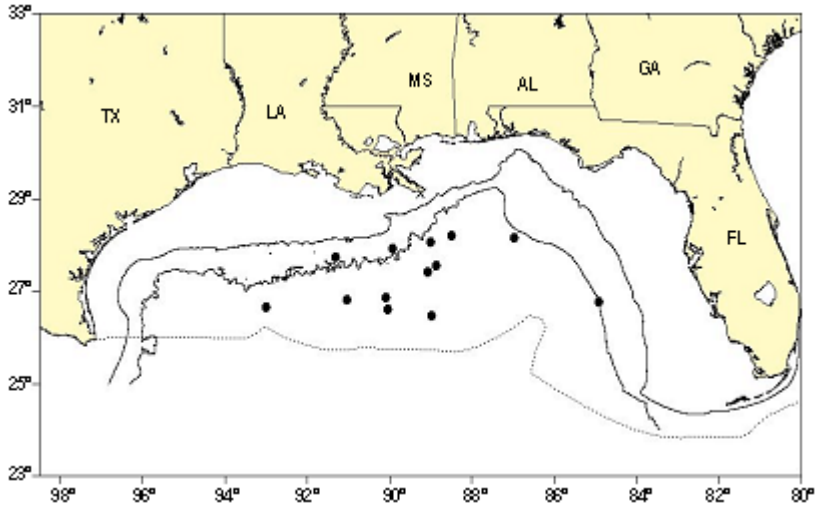

Figure 1. *Distribution of killer whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

combined was 277 (CV=0.42) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for killer whales in oceanic waters, pooled from 1996 to 2001, is 180 (CV=0.52) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~The best estimate of abundance for killer whales is 180 (CV=0.52). The minimum population estimate for the northern Gulf of Mexico is 119 (CV=0.52) killer whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995), however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 119 (CV=0.52). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5. PBR for the northern Gulf of Mexico killer whale is ~~2.0~~1.2.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortalities of a killer whale between 1997 and 2001(Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for killer whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with killer whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of killer whales in the northern Gulf of Mexico is unknown. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to killer whales by this fishery.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There were no reported strandings of killer whales in the Gulf of Mexico between 1997 and 2001. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of killer whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years. ~~This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR, therefore, this is not a strategic stock~~

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December 2002~~July 1995~~

FALSE KILLER WHALE (*Pseudorca crassidens*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The false killer whale is distributed worldwide throughout warm temperate and tropical oceans (Leatherwood and Reeves 1983). Sightings of this species in the northern Gulf of Mexico occur primarily over the deeper waters off the continental shelf (Mullin and Fulling, in progress). ~~[Southeast Fisheries Science Center (SEFSC) unpublished data]~~. False killer whales were seen only in the summer during ~~recent seasonal~~GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~ and Fargion 1996) and in the late spring during vessel surveys (Mullin and Fulling, in progress) (~~NMFS unpublished data~~).

The Gulf of Mexico population is provisionally being considered one stock for management purposes. Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of false killer whales by survey year was 661 (Coefficient of variation (CV)=0.88) in 1991, 196 (CV=1.00) in 1992, 77 (CV=1.08) in 1993, and 744 (CV=1.14) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of false killer whales for all surveys combined was 381 (CV=0.62) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

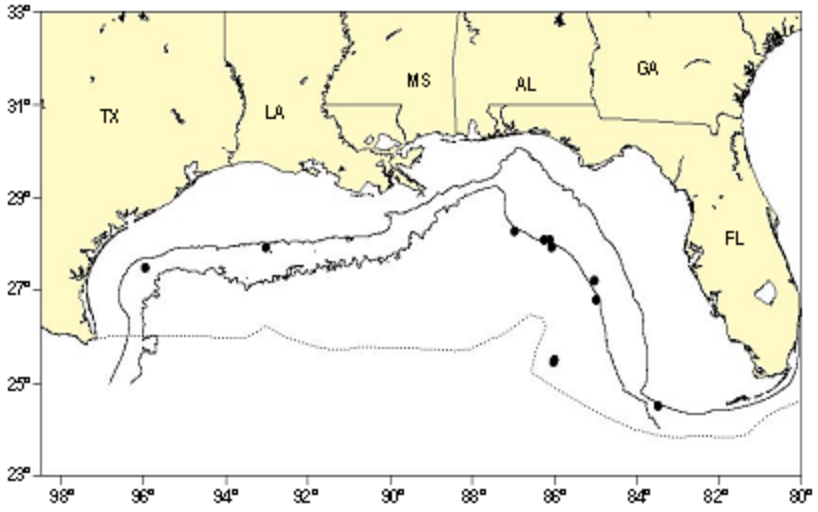

Figure 1. *Distribution of false killer whale sightings from SEFSC shipboard surveys during spring between 1996-2 001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for false killer whales in oceanic waters, pooled from 1996 to 2001, is 1,515 (CV=1.60) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the

northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for false killer whales is 1,515 (C=1.60). The minimum population estimate for the northern Gulf of Mexico is 587 (CV=1.60) false killer whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 587 (CV=1.60). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5. PBR for the northern Gulf of Mexico false killer whale is ~~2.4~~ 5.9.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been one reported fishing related mortality of a false killer whale from 1997 through 2001, which was a stranding in 1999 classified as likely caused by fishery interactions or other human-related causes due to mutilation of limbs (Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for false killer whales is 1, which is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with false killer whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of false killer whales in the northern Gulf of Mexico is unknown. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to false killer whales by this fishery. ~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There was one reported stranding of a false killer whale in the Gulf of Mexico, namely in Alabama in 1999, which was classified as likely caused by fishery interactions or other human-related causes. The fins and flukes of the animal had been amputated. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of false killer whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR and, therefore, cannot be considered to be insignificant and approaching zero mortality and serious injury rate. This is not strategic stock because the 1997-2001 estimated average annual fishery-related mortality and serious injury does not exceed PBR. ~~This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR, therefore, this is not a strategic stock~~

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December 2002~~July 1995~~

PYGMY KILLER WHALE (*Feresa attenuata*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The pygmy killer whale is distributed worldwide in tropical and subtropical waters (Ross and Leatherwood 1994). Sightings of these animals in the northern Gulf of Mexico occur primarily over the deeper waters off the continental shelf (Mullin and Fulling, in progress)~~[Southeast Fisheries Science Center (SEFSC) unpublished data]~~. ~~Pygmy killer whales and melon-headed whales (*Peponocephala electra*) are difficult to distinguish and sightings of either species are often categorized as pygmy killer/melon-headed whales~~Sightings of pygmy killer whales were documented in all seasons during ~~recent seasonal~~GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~and Fargion 1996).

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of pygmy killer whales by survey year was 2,347 (Coefficient of variation (CV)=0.81) in 1991, 356 (CV=0.73) in 1992, 153 (CV=1.53) in 1993 and zero in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of pygmy killer whales for all surveys combined was 518 (CV=0.81)(Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

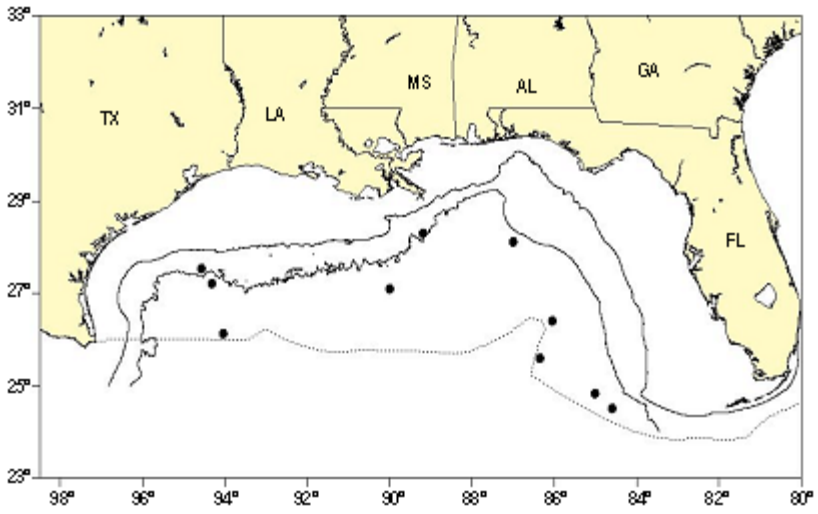

Figure 1. *Distribution of pygmy killer whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in

progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for pygmy killer whales in oceanic waters, pooled from 1996 to 2001, is 443 (CV=0.68) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for pygmy killer whales is 443 (CV=0.68). The minimum population estimate for the northern Gulf of Mexico is 264 (CV=0.68) pygmy killer whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~ There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 264 (CV=0.68). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OPS), is assumed to be 0.5. PBR for the northern Gulf of Mexico pygmy killer whale is ~~2.8~~2.6.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortalities of a pygmy killer whale between 1997 and 2001(Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for pygmy killer whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with pygmy killer whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of pygmy killer whales in the northern Gulf of Mexico is unknown. There has historically been some take of this species in small cetacean fisheries in the Caribbean (Caldwell and Caldwell 1971). Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~ 3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to pygmy killer whales by this fishery.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There were two reported strandings of pygmy killer whales in the Gulf of Mexico during 1997-2001. There was no evidence of human interactions in these stranded animals. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of pygmy killer whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years.. ~~This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR; therefore, this is not a strategic stock~~

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December 2002~~July 1995~~

DWARF SPERM WHALE (*Kogia sima*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The dwarf sperm whale appears to be distributed worldwide in temperate to tropical waters (Caldwell and Caldwell 1989). Sightings of these animals in the northern Gulf of Mexico occur primarily along the continental shelf edge and over the deeper waters off the continental shelf (Mullin *et al.* 1991; Mullin and Fulling, in progress). Dwarf sperm whales and pygmy sperm whales (*Kogia breviceps*) are difficult to differentiate at sea, ~~distinguish~~ and sightings of either species are often categorized as *Kogia* spp. Sightings of this category were documented in all seasons during ~~seasonal~~ GulfCet aerial surveys of the northern Gulf of Mexico from 1993 to 1995 (Hansen *et al*. 1996). Dwarf and pygmy sperm whales have been sighted in the northwestern Gulf of Mexico in waters 1000 m deep ~~on average~~ (Davis and Fargion 1996). These authors cautioned that inferences on preferred bottom depths should await surveys ~~for~~ of the entire Gulf of Mexico. The difficulty in sighting dwarf and pygmy sperm whales may be exacerbated by their avoidance reaction towards ships, and change in behavior towards approaching survey aircraft (Würsig *et al*. 1998).

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation. In a ~~recent~~ study using hematological and stable-isotope data, Barros *et al*. (1998) speculated that dwarf sperm whales may have a more pelagic distribution than pygmy sperm whales, and/or dive deeper during feeding bouts. ~~There is no information on stock differentiation.~~

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of dwarf and pygmy sperm whales by survey year was 109 (Coefficient of variation (CV)=0.68) in 1991, 1,010 (CV=0.40) in 1992, 580 (CV=0.45) in 1993, and 162 (CV=0.61) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of dwarf and pygmy sperm whales for all surveys combined was 547 (CV =0.28) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss

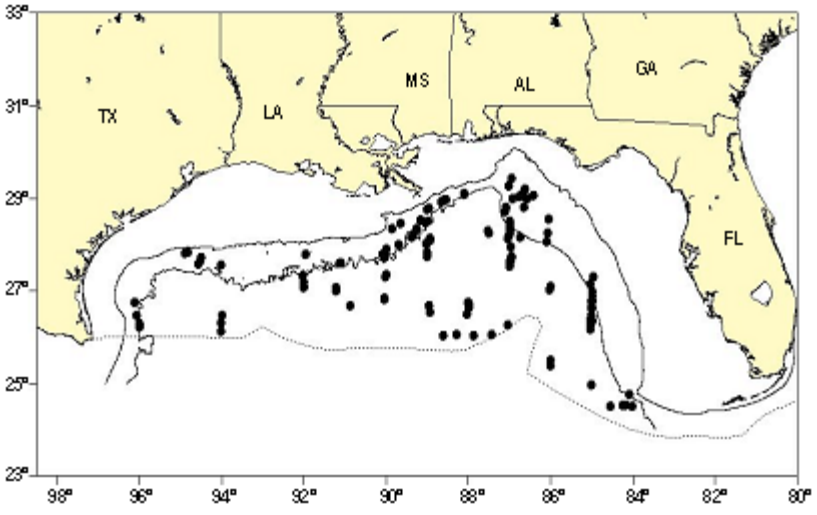

Figure 1. *Distribution of dwarf and pygmy sperm whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for dwarf and pygmy sperm whales in oceanic waters, pooled from 1996 to 2001, is 809 (CV=0.33) (Mullin and Fulling, in progress), which is the best available abundance estimate for these species in the northern Gulf of Mexico. A separate estimate of abundance for dwarf sperm whales cannot be estimated due to uncertainty of species identification at sea. This estimate is considered the best because these surveys have the most complete coverage of the species habitats. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for dwarf and pygmy sperm whales is 809 (CV=0.33). It is not possible to determine the minimum population estimate for only dwarf sperm whales. The minimum population estimate for the northern Gulf of Mexico is 617 (CV=0.33) dwarf and pygmy sperm whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995), however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~ There are insufficient data to determine the population trends for these species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment.~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size for dwarf and pygmy sperm whales is 617 (CV=0.33). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OPS), is assumed to be 0.5. PBR for the northern Gulf of Mexico dwarf and pygmy sperm whales is 6.2. It is not possible to determine the PBR for only dwarf sperm whales.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortality of dwarf or pygmy sperm whales (Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for dwarf and pygmy sperm whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for these stocks.

~~Available information indicates there likely is little, if any, fisheries interaction with dwarf sperm whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of dwarf sperm whales in the northern Gulf of Mexico is unknown. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999, and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999, and 4% in 2000. There were no reports of mortality or serious injury to dwarf sperm whales by this fishery.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There were no documented strandings of dwarf sperm whales in the northern Gulf of Mexico during 1997 and 2001, wich were classified as likely caused by fishery interactions, but there have been stranding investigation reports of dwarf sperm whales which may have died as a result of other human-related causes. A total of at least 17 dwarf sperm whale strandings were dcumented in the nrther Gulf of Mexico from 1990 through 2001. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of dwarf sperm whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There and there are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years.

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December 2002~~July 1995~~

PYGMY SPERM WHALE (*Kogia breviceps*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The pygmy sperm whale appears to be distributed worldwide in temperate to tropical waters (Caldwell and Caldwell 1989). Sightings of these animals in the northern Gulf of Mexico occur primarily along the continental shelf edge and over the deeper waters off the continental shelf (Mullin *et al.* 1991; Mullin and Fulling, in progress). Pygmy sperm whales and dwarf sperm whales (*Kogia sima*) are difficult to differentiate at sea, ~~distinguish~~ and sightings of either species are often categorized as *Kogia* spp. Sightings of this category were documented in all seasons during ~~seasonal~~ GulfCet aerial surveys of the northern Gulf of Mexico from 1993 to 1995 (Hansen *et al*. 1996). Pygmy and dwarf sperm whales have been sighted in the northwestern Gulf of Mexico in waters 1000 m deep ~~on average~~ (Davis and Fargion 1996). These authors cautioned that inferences on preferred bottom depths should await surveys ~~for~~ of the entire Gulf of Mexico. The difficulty in sighting pygmy and dwarf sperm whales may be exacerbated by their avoidance reaction towards ships, and change in behavior towards approaching survey aircraft (Würsig *et al*. 1998).

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation. In a ~~recent~~ study using hematological and stable-isotope data, Barros *et al*. (1998) speculated that dwarf sperm whales may have a more pelagic distribution than pygmy sperm whales, and/or dive deeper during feeding bouts. ~~There is no information on stock differentiation.~~

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of pygmy and dwarf sperm whales by survey year was 109 (Coefficient of variation (CV)=0.68) in 1991, 1,010 (CV=0.40) in 1992, 580 (CV=0.45) in 1993, and 162 (CV=0.61) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of pygmy and dwarf sperm whales for all surveys combined was 547 (C =0.28) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable,

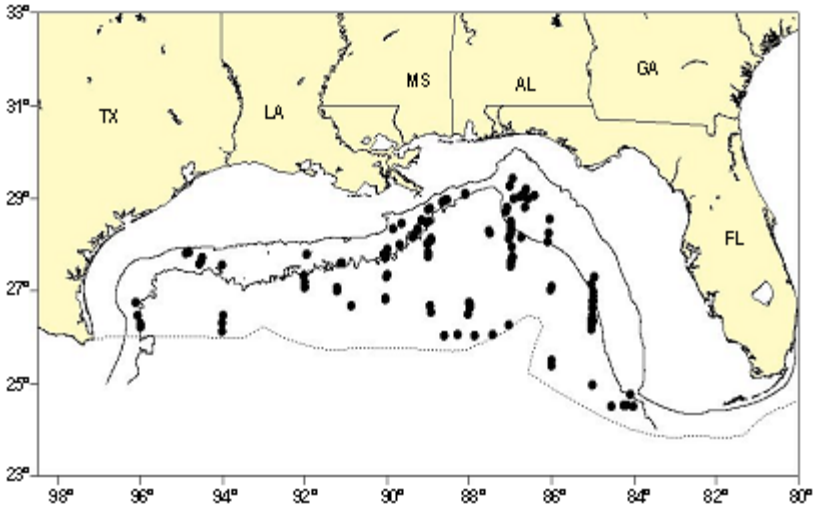

Figure 1. *Distribution of pygmy and dwarf sperm whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

and therefore should not be used for PBR determinations.

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and the *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for pygmy and dwarf sperm whales in oceanic waters, pooled from 1996 to 2001, is 809 (CV=0.33) (Mullin and Fulling, in progress), which is the best available abundance estimate for these species in the northern Gulf of Mexico. A separate estimate of abundance for pygmy sperm whales cannot be estimated due to uncertainty of species identification at sea. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~ The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~The best estimate of abundance for pygmy and dwarf sperm whales is 809 (CV=0.33). It is not possible to determine the minimum population estimate for only pygmy sperm whales. The minimum population estimate for the northern Gulf of Mexico is 617 (CV=0.33) pygmy and dwarf sperm whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~ There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size for pygmy and dwarf sperm whales is 617 (CV=0.33). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5. PBR for the northern Gulf of Mexico pygmy and dwarf sperm whales is 6.2. It is not possible to determine the PBR for only pygmy sperm whales.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortality of dwarf or pygmy sperm whales (Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for pygmy and dwarf sperm whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with dwarf sperm whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of dwarf sperm whales in the northern Gulf of Mexico is unknown. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~ Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999, and 4% in 2000. There were no reports of mortality or serious injury to dwarf sperm whales by this fishery.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999 has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

At least ~~20~~22 pygmy sperm whale strandings were documented in the northern Gulf of Mexico from 1990 through ~~October 1998~~2001. Two of these animals had a plastic bag or pieces thereof in their stomachs (Tarpley and Marwitz 1993; Barros unpublished data). Another animal stranded apparently due to injuries inflicted by impact, possibly with a vessel. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of dwarf sperm whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~ are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years.

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December 2002~~July 1995~~

MELON-HEADED WHALE (*Peponocephala electra*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The melon-headed whale appears to be distributed worldwide in tropical to sub-tropical waters (Jefferson *et al.* 1992). Sightings of these animals in the northern Gulf of Mexico occur primarily over the deeper waters off the continental shelf (Mullin *et al.* 1994). ~~Melon-headed whales and pygmy killer whales (*Feresa attenuata*) are difficult to distinguish and sightings of either species are often categorized as pygmy killer/melon-headed whales.~~ Sightings of melon-headed whales were documented in all seasons during ~~recent seasonal~~ GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~ and Fargion 1996).

The Gulf of Mexico population is provisionally being considered one stock for management purposes. Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of melon-headed whales by survey year was zero in 1991, 3,174 (Coefficient of variation (CV)=0.54) in 1992, 827 (CV=0.70) in 1993 and 10,586 (CV=0.48) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of melon-headed whales for all surveys combined was 3,965 (CV=0.39)(Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

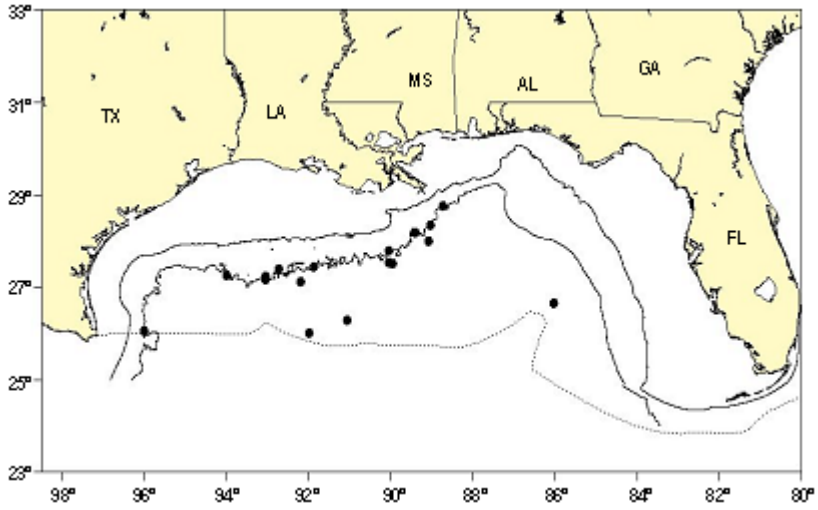

Figure 1. *Distribution of melon-headed whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for melon-headed whales in oceanic waters, pooled from 1996 to 2001, is 3,320 (CV=0.56) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for melon-headed whales is 3,320 (CV=0.56). The minimum population estimate for the northern Gulf of Mexico is 2,139 (CV=0.56) melon-headed whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 2,139 (CV=0.56). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OPS), is assumed to be 0.5. PBR for the northern Gulf of Mexico melon-headed whale is ~~29~~21.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortalities of a melon-headed whale between 1997 and 2001 (Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for melon-headed whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

Fisheries Information

The level of past or current, direct, human-caused mortality of melon-headed whales in the northern Gulf of Mexico is unknown. There has historically been some take of this species in small cetacean fisheries in the Caribbean (Caldwell *et al.* 1976). Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400~~

~~sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to melon-headed whales by this fishery.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There was one reported stranding of a melon-headed whale in the Gulf of Mexico between 1997 and 2001, though there was no evidence of human interaction in this stranded animal. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of melon-headed whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years.~~: This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR; therefore, this is not a strategic stock~~

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December 2002~~July 1995~~

RISSO'S DOLPHIN (*Grampus griseus*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Risso's dolphin is distributed worldwide in tropical to warm temperate waters (Leatherwood and Reeves 1983). Sightings of these animals in the northern Gulf of Mexico occur primarily along the continental shelf and continental slope (Mullin *et al.* 1991; Mullin and Fulling, in progress)~~Southeast Fisheries Science Center, SEFSC, unpublished data)~~. Risso's dolphin were seen in all seasons during ~~recent seasonal~~GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~and Fargion 1996) and in the late spring during vessel surveys (Mullin and Fulling, in progress~~, SEFSC, unpublished data~~).

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of Risso's dolphins by survey year was 667 (Coefficient of variation (CV)=0.95) in 1991, 2,325 (CV=0.34) in 1992, 1,408 (CV=0.41) in 1993 and 6,332 (CV=0.45) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of Risso's dolphins for all surveys combined was 2,749 (CV=0.27) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

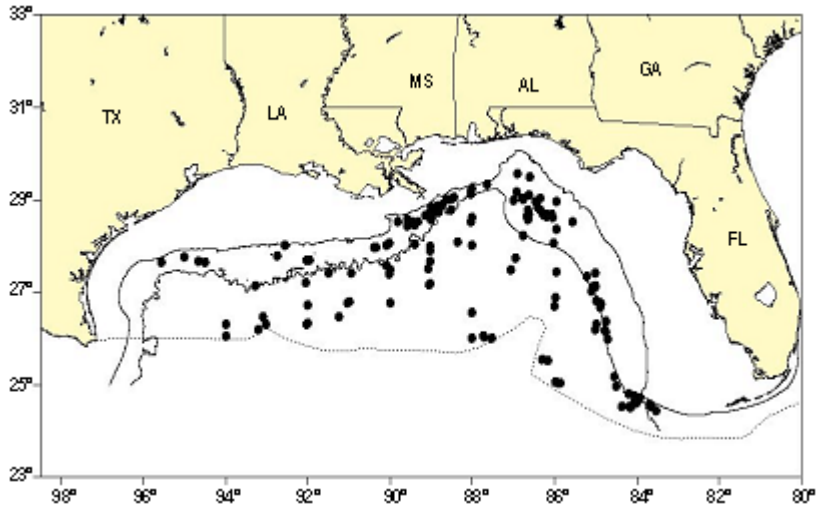

Figure 1. *Distribution of Risso's dolphin sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for Risso's dolphins in oceanic waters, pooled from 1996 to 2001, is 1,777 (CV=0.34) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for Risso's dolphins is 1,777 (CV=0.34). The minimum population estimate for the northern Gulf of Mexico is 1,345 (CV=0.34) Risso's dolphins.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~ There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 1,345 (CV=0.34). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5. PBR for the northern Gulf of Mexico Risso's dolphin is ~~22~~14.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortalities of a Risso's dolphin between 1997 and 2001 (Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for Risso's dolphins is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with Risso's dolphins in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of Risso's dolphins in the northern Gulf of Mexico is unknown. This species has been taken in the U.S. longline swordfish/tuna fishery in the northern Gulf of Mexico and in the U.S. Atlantic (Lee *et al.* 1994). Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to Risso's dolphins by this fishery between 1997 and 2001 (Yeung 1999; Yeung 2001). One Risso's dolphin was observed taken and released alive during 1992; the extent of injury to the animal was unknown (SEFSC, unpublished data). One lethal take of a Risso's dolphin by the fishery was observed in the Gulf of Mexico during 1993 (SEFSC, unpublished data). Estimated average annual fishery-related mortality and serious injury attributable to the longline swordfish/tuna fishery in the Gulf of Mexico during 1992-1993 was 19 Risso's dolphins annually (CV=0.20).

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There were two reported strandings of Risso's dolphin in the Gulf of Mexico between 1997 and 2001. There was no evidence of human interactions in these stranded animals. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of Risso's dolphins in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years. ~~This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR; therefore, this is not a strategic stock~~

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December 2002~~July 1995~~

SHORT-FINNED PILOT WHALE (*Globicephala macrorhynchus*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The short-finned pilot whale is distributed worldwide in tropical to ~~warm~~ temperate waters (Leatherwood and Reeves 1983). Sightings of these animals in the northern Gulf of Mexico occur primarily along the continental shelf and continental slope (Mullin *et al.* 1991; Mullin and Fulling, in progress) ~~Southeast Fisheries Science Center (SEFSC) unpublished data~~]. Short-finned pilot whales were seen in all seasons during ~~recent seasonal~~GulfCet aerial surveys of the northern Gulf of Mexico between 1993 and 1995 (Davis ~~et al., in preparation~~ and Fargion 1996).

The Gulf of Mexico population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic stock(s). Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation. ~~There is no information on stock differentiation for the Atlantic population~~

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland *et al.* 1993) and the computer program DISTANCE (Laake *et al.* 1993) to sighting data. During 1991 through 1994, line-transect vessel surveys were conducted from spring through summer in the northern Gulf of Mexico from the 200 m isobath to the seaward extent of the U.S. Exclusive Economic Zone (EEZ) (Hansen *et al.* 1995). This included data collected as part of the GulfCet program (Davis and Fargion 1996). Estimated abundance of short-finned pilot whales by survey year was zero in 1991, 909 (Coefficient of variation (CV)=0.62) in 1992, 103 (CV=0.1.20) in 1993 and 240 (CV=1.03) in 1994 (Hansen *et al.* 1995). Survey effort-weighted estimated average abundance of short-finned pilot whales for all surveys combined was 353 (CV=0.89) (Hansen *et al.* 1995). As recommended in the GAMMS Workshop Report (Wade and Angliss 1997), estimates older than eight years are deemed unreliable, and therefore should not be used for PBR determinations.

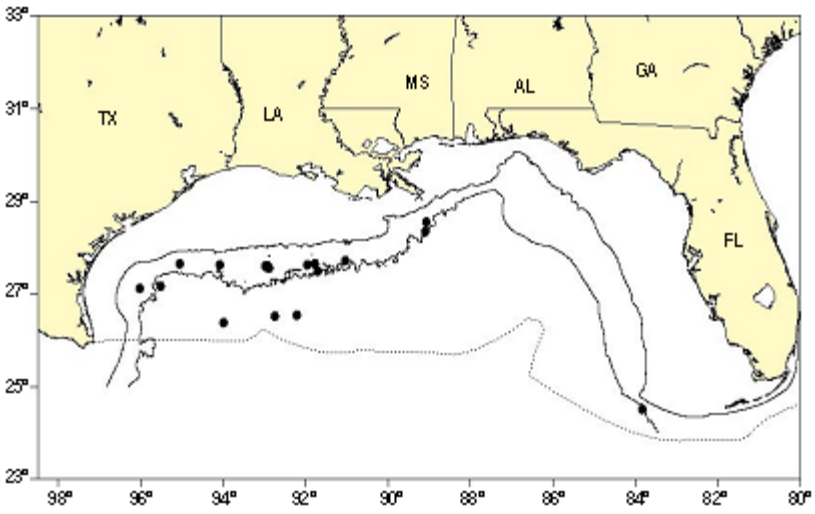

Figure 1. *Distribution of short-finned pilot whale sightings from SEFSC shipboard surveys during spring between 1996-2001. All the on-effort sightings are shown, though not all were used to estimate abundance. Solid lines indicate the 100 m and 1000 m isobaths and the dotted line indicates the offshore extent of the U.S. EEZ.*

Surveys were conducted from April to May 1996 to 2001 (excluding 1998) in oceanic waters of the northern Gulf of Mexico, using the NOAA ships *Oregon II* (1996, 1997, 1999) and *Gordan Gunter* (2000, 2001). Tracklines, which were perpendicular to the bathymetry, covered the waters from 200 m to the offshore extent of the U.S. EEZ. Estimates for all oceanic strata were summed, as survey effort was not uniformly distributed, to calculate a total estimate for the entire northern Gulf of Mexico oceanic waters (Fig. 1; Mullin and Fulling, in progress). Due to limited survey effort in any given year, survey effort was pooled across all years to develop an average abundance estimate.

The estimate of abundance for short-finned pilot whales in oceanic waters, pooled from 1996 to 2001, is 3,252 (CV=0.49) (Mullin and Fulling, in progress), which is the best available abundance estimate for this species in the northern Gulf of Mexico. This estimate is considered the best because these surveys have the most complete coverage of the species' habitat. The differences between the older (1991-1994) and the more recent (1996-2001) abundance estimates are being investigated. The analytical methods were not completely similar and may have contributed to these differences. A re-analysis of the earlier data is underway so that valid comparisons can be made to look for population trends.

Minimum Population Estimate

~~The minimum population size was estimated from the average estimate abundance which was 127 Fraser's dolphins (CV = 0.90) (Hansen et al. 1995).~~The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distributed abundance estimate as specified by Wade and Angliss (1997). ~~NMFS (Anon. 1994).~~ The best estimate of abundance for short-finned pilot whales is 3,252 (CV=0.49). The minimum population estimate for the northern Gulf of Mexico is 2,124 (CV=0.49) short-finned pilot whales.

Current Population Trend

~~No trend was identified in the annual abundance estimates. There were no observations of Fraser's dolphins during 1991 and 1993 vessel surveys, and the 1992 estimate is based on only one observation (Hansen et al. 1995); however, five other sightings of Fraser's dolphins were documented in the northern Gulf of Mexico during other surveys in 1992, 1993 and 1994 (Leatherwood et al. 1993, SEFSC unpublished data). The apparent differences in abundance estimates may have been caused by low sampling intensity relative to population size (Hansen et al. 1995) or by inter-annual variation in distribution patterns or spatial sampling patterns, rather than changes in population size.~~ There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. ~~therefore, the default maximum net productivity rate of 0.04 (Anon. 1994) was used for purposes of this assessment~~For purposes of this assessment, the maximum net productivity rate was assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a recovery factor (MMPA Sec. 3.16 U.S.C. 1362; Wade and Angliss 1997). The minimum population size is 2,124 (CV=0.49). The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5. PBR for the northern Gulf of Mexico short-finned pilot whale is ~~1.9~~21.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There has been no reported fishing related mortalities of a short-finned pilot whale between 1997 and 2001(Yeung 1999; Yeung, 2001). Observed fishery-related mortality and serious injury for short-finned pilot whales is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock.

~~Available information indicates there likely is little, if any, fisheries interaction with short-finned pilot whales in the northern Gulf of Mexico. The total known fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can be considered insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.~~

Fisheries Information

The level of past or current, direct, human-caused mortality of short-finned pilot whales in the northern Gulf of Mexico is unknown. Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total U.S. longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was ~~4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994)~~3,138 sets in 1998, 4,270 sets in 1999 and 4,483 sets in 2000 (Yeung 1999; Yeung, 2001). ~~This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992~~Observer coverage for the Gulf as a percentage of total sets was 2% in 1998, 4% in 1999 and 4% in 2000. There were no reports of mortality or serious injury to short-finned pilot whales by this fishery. There was one logbook report of a fishery-related injury of a pilot whale in the northern Gulf of Mexico in 1991.

~~Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery, which operated along the west coast of Florida during 1997-1999, has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.~~

Other Mortality

There were two reported strandings of short-finned pilot whales in the Gulf of Mexico between 1997 and 2001. There was no evidence of human interactions in these stranded animals. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

STATUS OF STOCK

The status of short-finned pilot whales in the northern Gulf of Mexico, relative to OSP, is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. There ~~and there~~are insufficient data to determine the population trends for this species. The total fishery-related mortality and serious injury for this stock is unknown, but assumed to be less than 10% of the calculated PBR and can be considered to be insignificant and approaching zero mortality and serious injury rate. This is not a strategic stock because average annual fishery-related mortality and serious injury has not exceeded PBR for the last two years. ~~This species is not listed under the Endangered Species Act. The total level of human-caused mortality and serious injury is unknown, but it is believed to be low relative to PBR; therefore, this is not a strategic stock~~

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